WHAT IS CLAIMED IS:

1. A programmable gain attenuator comprising:

a termination resistor;

a first termination switch connecting one side of the termination resistor to a first output;

a second termination switch connecting another side of the termination resistor to a second output;

a first resistor ladder arranged between a first input and the first side of the termination resistor;

a first plurality of switches each connecting a corresponding tap from the first resistor ladder to the first output;

a second resistor ladder arranged between a second input and the second side of the termination resistor; and

a second plurality of switches each connecting a corresponding tap from the second resistor ladder to the second output,

wherein a first switch of the first plurality of switches is turned on, followed by a second switch of the first plurality of switches turned off, followed by a third switch of the first plurality of switches turned on, and

wherein a first switch of the second plurality of switches is turned on, followed by a second switch of the second plurality of switches turned off, followed by a third switch of the second plurality of switches turned on.

2. The programmable gain attenuator of claim 1, wherein the first switch of the first plurality of switches includes a plurality of switches, and wherein the first switch of the second plurality of switches includes a plurality of switches.

3. The programmable gain attenuator of claim 1, wherein the second switch of the first plurality of switches includes a plurality of switches, and wherein the second switch of the second plurality of switches includes a plurality of switches.

4. The programmable gain attenuator of claim 1, wherein the third switch of the first plurality of switches includes a plurality of switches, and wherein the third switch of the second plurality of switches includes a plurality of switches.

5. The programmable gain attenuator of claim 1, further including a plurality of resistors connected between the corresponding taps of the first and second resistor ladders.

6. A single-ended programmable gain attenuator comprising:

a termination resistor;

a termination switch connecting one side of the termination resistor to an output;

a resistor ladder arranged between an input and the one side of the termination resistor; and

a plurality of switches each connecting a corresponding tap from the resistor ladder to the output,

wherein a first switch of the first plurality of switches is turned on, followed by a second switch of the first plurality of switches turned off, followed by a third switch of the first plurality of switches turned on.

7. The single-ended programmable gain attenuator of claim 6, wherein the first switch of the plurality of switches includes a plurality of switches.

8. The single-ended programmable gain attenuator of claim 6, wherein the second switch of the plurality of switches includes a plurality of switches.

9. The single-ended programmable gain attenuator of claim 6, wherein the third switch of the plurality of switches includes a plurality of switches.

10. A single-ended programmable gain attenuator comprising:

a resistive ladder;

a plurality of switches corresponding to the resistive ladder and each connected to corresponding taps of the resistive ladders and to an output;

a termination resistor,

wherein non-consecutive switches in the plurality of switches are turned on to interpolate a desired voltage at the output.

11. A programmable gain attenuator comprising:

two resistive ladders;

a plurality of switches corresponding to each resistive ladder and each connected to corresponding taps of the two resistive ladders and to an output;

a termination resistor,

wherein non-consecutive switches in each of the plurality of switches are turned on to interpolate a desired voltage at the output.

12. A method of programming a gain of an attenuator comprising:

applying a differential input voltage to a first resistor ladder arranged between a first input and the first side of the termination resistor a termination resistor and to a second resistor ladder arranged between a second input and the second side of the termination resistor;

turning a first switch of a first plurality of switches on, turning a second switch of the first plurality of switches off, and turning a third switch of the first plurality of switches turned on,

wherein the first plurality of switches connect corresponding taps from the first resistor ladder to a first output;

simultaneously turning a first switch of a second plurality of switches on, turning a second switch of the second plurality of switches off, and turning a third switch of the second plurality of switches on,

wherein the second plurality of switches connects corresponding taps from the second resistor ladder to a second output, and

wherein the switches are used to obtain an interpolated voltage.

13. The method of claim 12, wherein the first switch of the first plurality of switches includes a plurality of switches, and wherein the first switch of the second plurality of switches includes a plurality of switches.

14. The method of claim 12, wherein the second switch of the first plurality of switches includes a plurality of switches, and wherein the second switch of the second plurality of switches includes a plurality of switches.

15. The method of claim 12, wherein the third switch of the first plurality of switches includes a plurality of switches, and wherein the third switch of the second plurality of switches includes a plurality of switches.